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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/938,378      | 08/24/2001  | Ronaldus Maria Aarts | NL000467            | 1555             |

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| EXAMINER |
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CHANG, EDITH M

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| ART UNIT | PAPER NUMBER |
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2637

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|  |                                      |  |  |
|--|--------------------------------------|--|--|
| <p align="center"><b>Office Action Summary</b></p> | <b>Application No.</b><br>09/938,378 | <b>Applicant(s)</b><br>AARTS, RONALDUS MARIA |  |
|  | <b>Examiner</b><br>Edith M Chang     | <b>Art Unit</b><br>2637                      |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 August 2001.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-16 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>Jan 30 2002</u>   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Specification***

1. The abstract of the disclosure is objected to because the last line "(Fig. 1)" should be deleted. Correction is required. See MPEP § 608.01(b).
2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

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3. For the formality of the application under the present office practice, applicant(s) is required to replace "CLAIMS" with "I or We Claim", "The Invention Claimed Is" (or the equivalent) before the Claims part of the specification of the instant application. See MPEP 608.01(m).

### *Drawings*

4. The blocks 10, 12, 14 and 16 in the figure on the drawing sheet 1/1 need to have descriptive labels, in conformance with 37 CFR 1.84(n) and 1.84(o). For example, a descriptive label of "non-linear device" should be inserted into block 10 to properly describe the element.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

*Claim Objections*

5. Claims 1-12, 14-16 are objected to because of the following informalities:

Claim 1, line 1: "Method" is suggested changing to "A method".

Claims 1, 12 & 16, regarding to the "n" in terms "n bits" and "m" in terms "m bits", the claims need to have the legend to define the "n" and "m".

Claims 2-11, line 1: "Method" is suggested changing to "The method".

Claim 10, line 1: "(Mo) from a" is suggested changing to "(Do) from the"; and line 5: "the quantising" is suggested changing to "the quantising said reduced word length signal".

Claim 11, line 3: "(Mo)" is suggested changing to "(Do)".

Claim 12, line 1: "Signal" is suggested changing to "A signal"; line 5: "to an" is suggested changing to "to a"; and line 11: "the quantizing" is suggested changing to "the first quantising".

Claim 14, line 1: "Signal" is suggested changing to "A signal"; and line 2: "(Mo)" is suggested changing to "(Do)".

Claim 15, line 1: "Signal" is suggested changing to "The signal"; and line 5: "(Mo)" is suggested changing to "(Do)".

Claim 16, line 1: "Signal" is suggested changing to "A signal"; and line 2: "to the" is suggested changing to "to a".

Appropriate correction is required.

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

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pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In claim 9, the configuration of the claim does not correspond to the disclosure of drawing.

#### ***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2-4, 7-8 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, line 2: "the quantisation step for large amplitudes" lacks antecedent basis.

Claim 6, "noise shaping techniques" does not clearly indicate what are the "noise shaping techniques" to particularly point out the subject matter regards as the invention.

Claim 7 line 2 & Claim 8 line 3: "and/or" renders the claim indefinite because it is unclear whether the limitation is "and" or not, or "or" or not.

Claims 3-4 are directly or indirectly dependent on the rejected claim 2.

#### ***Claim Rejections - 35 USC § 102***

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10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 5-6, 10-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Todd et al. (US 5,402,124).

**To claims 1, 12 & 16**, Todd teaches the signal processing apparatus and its method in FIG.10 and FIG.11.

In FIG.10, a *pseudo random number generator* and an *adder* comprised in the DITHERER (element 110 FIG.10, column 8 lines 22-25) providing the noise/dither component added to the 8 bits PCM digital from the FILTER BANK (element 108 FIG.10 column 6 line 25-30 & column 8 lines 20-22), wherein the dithering is adding in a random noise (column 3 lines 38-45) generated from the dither noise generator/PN generator (column 8 lines 22-25) with the defined parameters (column 9 lines 15-24 where defined the parameters), to provide the intermediate signal, the output of the DITHERER;

the *QUANTIZER* (element 112 of FIG.10) as the first quantising element receives the intermediate signal produced by adding the dither component/noise to the digital signal from the DITHERER and quantizes the 8 bits PCM signal of the intermediate signal to the 3 bits representation. The quantizing is a non-linear function defined by the non-linear device parameters such as the quantizing levels (represented by 3 bits) shown in FIG.7 and stated in column 2 lines 17-30, wherein the quantizing representative is 3 bits less than the 8 bits signal before the quantizing.

**To claim 2**, in FIG.9c and column 7 lines 28-30, Todd teaches smaller quantisation step for small amplitudes.

**To claims 5 & 6**, Todd teaches the amplitude of the noise signal generated for the dither component is fixed as the pseudo random number or by shaping techniques such as amplitude probability density function and spectral shapes stated in column 9 lines 15-24.

**To claims 10-11 & 14-15**, in FIG. 11, Todd teaches DEQUANTIZER as the second quantisation element (element 208 of FIG.11) performs the inverse function of the QUANTIZER (element 112 of FIG.10) to get the 8 bit digital signal with the dither component, the DITHERER with a second dither/PN generator providing the dither component/noise (element 210 of FIG.11) perform the complementarily the DITHERER of encoder did (column 9 lines 30-40) on the signal from DEQUATIZER.

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Todd et al. (US 5,402,124) in view of Heddle (US 5,946,652).

**To claim 3**, Todd does not explicitly specify the gain of the quantizing function. However Heddle shows the quantizing function in FIG.4, FIG.5 and column 3 lines 20-25. As Todd teaches the non-linearly quantizing and dequantizing small amplitude signals, at the



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time of the invention, it would have been obvious to a person of ordinary skill in the art to adopt the well known quantizing function that the smaller amplitude signal has the gain substantially equaling to unit and the larger amplitude signal having decreased gain (as shown in the FIG.4 and FIG.5 of Heddle) in Todd's quantizing function to distributing the quantizing values non-uniformly for the purpose of getting better accurate quantizing result.

14. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Todd et al. (US 5,402,124) in view of Nishio et al. (US 5,774,842).

**To claim 7**, Todd does not explicitly specify the recording medium, however Nishio teaches the dithered signal in the recording medium in FIG.14, FIG.15 and column 11 line 57-column 12 line 8. As Todd's encoder and decoder with dither method for audio signals (column 1 lines 5-12), and Nishio teaches the encoded dithered signal recorded on a recording medium such as CD (compact disk) shown in FIG.14, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Todd's encoded audio signal recorded in a CD taught by Nishio for the purpose to provide a method and apparatus to have a good sound quality in the recording medium (column 3 lines 5-10).

**To claim 9**, Todd does not explicitly specify the difference signal, however in FIG.8, Nishio teaches a noise reduction method and apparatus with the difference signal provided by element 12, the difference of the quantized signal from element 11 and intermediate signal from the adder 10. As Todd's encoder with dither method for reducing quantizing noise, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the noise

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reduction apparatus and method taught by Nishio in Todd's encoder for the purpose of reducing quantizing errors and to provide high quality sound signal (column 3 lines 5-10).

***Allowable Subject Matter***

15. Claims 4 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least a signal processing apparatus for reducing the number of bits of a digital input signal and its method as a whole, the combination of elements and features, which includes the first transfer function for quantizing as a tanh function  $= c_1 \tanh (c_2 D_1 + c_3)$ ; and the reduced word length signal recorded on a first channel and the non-linear parameters and the noise parameters recorded on a second channel of a compact disc.

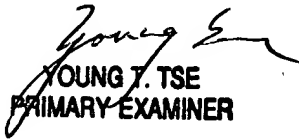
17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang  
November 9, 2004

  
YOUNG T. TSE  
PRIMARY EXAMINER